ADMINISTRATIVE RECORD

1280751 - R8 SDMS

ENTERED AUG 1 2 1983

08MT004

ADJUSTED FINAL

Facility name: MILLTOWN RESERVOIR SEDIMENTS

Location: MILLTOWN, MONTANA {CLARK FORK RIVER

EPA Region: VIII

Person(s) in charge of the facility: JIM DUNN, BMD

BILL ENGLE, BMD

VIC ANDERSEN, SWMB; JIM MIELSTEAD, WQB both w/ MDHES

Name of Reviewer: ______ Date: ______

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

COPPER MINING AND SMELTING EFFLUENTS AND TAILINGS HAVE BEEN ACCUMULATING AS SEDIMENTS IN THE RESERVOIR BEHIND MILLTOWN DAM SINCE THE EARLY 1900's. RESERVOIR-FLUSHING FISH KILLS & RECENT DRINKING WATER WELL [illegible] INDICATE THAT THE SEDIMENTS ARE A SOURCE OF HAZARDOUS SUBSTANCES. RECENT [illegible] ANALYSES SHOW THAT [illegible] CONDITIONS IN THE [illegible] MOBILIZATION OF HEAVY METALS INTO THE DRINKING WATER AQUIFER

Scores: S_M = 43.78 S_{gw} = 59.18 S_{sw} = 47.27 S_a = 0.0

S_{FE} = 0

S_{DC} = 0

Score changes due to rounding

08 / /82

FIGURE 1
HRS COVER SHEET

43.78

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100005

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Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	26	
5 Targets					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 (20) / 24 30 32 35 40	1	20	40	
Total Targets Score			29	49	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5		33930		57.330	
7 Divide line 6 by 57.330 and multiply by 100		S_{gw} = 59.18			

FIGURE 2
GROUND WATER ROUTE WORK SHEET

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Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 3	2		6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 (20) 24 30 32 35 40	1	20	40	
Total Targets Score			26	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5		30	420	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{SW} = 47.27			

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

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Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	(0)	45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
Total Targets Score				39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100			S_a = (0)		

FIGURE 9
AIR ROUTE WORK SHEET

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	s	s^2
Groundwater Route Score (S_{gw})	59.18	3502.27
Surface Water Route Score (S_{sw})	47.27	2234.45
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		5736.72
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		75.74
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		43.78

FIGURE 10
WORKSHEET FOR COMPUTING S_M

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N/A

Fire and Explosion Work Sheet				
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} =			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

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Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1		45	3.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1		3	3.2
3 Containment	0 15	1		15	3.3
4 Waste Characteristics Toxicity	0 1 2 3	5		15	3.4
5 Targets					3.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Critical Habitat	0 1 2 3	4		12	
NOT SCORED					
Total Targets Score				32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{DC} = (0)				

FIGURE 12
DIRECT CONTACT WORK SHEET

MILLTOWN GROUNDWATER CONTAMINATION

In May of 1981, routine samples were taken from drinking water wells located in the community of Milltown, Montana, by Missoula County Environmental Health Officials. Of the seven wells tested, four of these wells showed elevated levels of arsenic, based on State Department of Health and Environmental Sciences laboratory analyses, that exceeded the EPA Interim Primary Drinking Water Standard for arsenic. Subsequent analyses by DHES confirmed in December of 1981 that the four wells, serving a total of 33 residences, were contaminated with up to ten (10) times the Drinking Water Standard of 0.05 mg/l As. Residents were advised to not utilize this water for drinking and cooking and to seek alternate supplies of potable water.

Tests on other wells in the area indicate zero or minimally-detectable levels of arsenic, but these wells are apparently not currently capable of supplying affected Milltown consumers. Analyses performed in 1979 detected virtually no arsenic in residents' well water. Montana DHES officials have determined that the arsenic contaminants are 50 percent trivalent and 50 percent pentavalent; at this time no further contaminant characterization is available.

Speculation on the sources of contamination is divided between leachate from an old, abandoned landfill located east of town (contents unknown) or dissolution of metals from mill tailings (sediments) historically deposited behind Milltown Dam located south and immediately adjacent to the town and across the Clark Fork River. Initial analyses of deposited sediment elution indicate low levels (0.09 mg/l) total recoverable arsenic. No samples of the landfill cores have yet been taken.

Milltown is located on an alluvial isthmus between the Clark Fork River and the Blackfoot River. Groundwater hydrology is principally influenced by these two surface streams, and the principle subsurface strata is cobble and boulders. A study of the hydrogeology of the Milltown area was undertaken by the University of Montana in Missoula, largely supported by EPA contract dollars. Results of the study are not available yet, but preliminary indications are that no one source can be identified as the instigator of the above arsenic contamination.

Based on evaluation by the Montana Department of Health and Environmental Sciences and the Environmental Protection Agency Montana Office, of the information to date, it was decided that further investigation or remedial action could best be addressed by including the site on the National Contingency Plan list of priority hazardous waste sites currently being completed by EPA.

June 28, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: MILLTOWN RESERVOIR SEDIMENTS

LOCATION: MILLTOWN, MONTANA {CLARK FORK RIVER

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

ARSENIC HAS BEEN DETECTED
UP TO 10 X DWS.

ALSO FOUND CU, ZN, PB, MN.

Rationale for attributing the contaminants to the facility:

SEE ATTACHED DRAFT LETTER
10/3/82 JOHNNIE MOORE
UNIV. OF MONTANA

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Depth from the ground surface to the lowest point of waste disposal/ storage:

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

Mean annual lake or seasonal evaporation (list months for seasonal):

Net precipitation (subtract the above figures):

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Permeability associated with soil type:

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated: ARSENIC COMPOUNDS
LEAD "
ZINC "
COPPER "

Compound with highest score:
ARSENIC 3 - PERSISTENCE (METALS)
3 - TOXICITY (SAX, 4th ed.)
SCORE = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

SEDIMENT: 511,680 TONS — 1×10^6 TONS

SCORE = 8

Basis of estimating and/or computing waste quantity:
PERSONAL COMMUNICATION W/,
ELAINE BIRD, MISSOULA COUNTY &
DR. WM. WOESSNER, UNIV. OF MONTANA

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

DRINKING WATER - NO OTHER SOURCE AVAILABLE
INDUSTRIAL
IRRIGATION

SCORE = 3

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

WELL No. 9A (WOESSNER), EAST OF 207 3RD ST., MILLTOWN
MISSOULA CO.: NW¼ SE¼ NE¼ NE¼ SW¼ SEC. 21, RANGE 13N, TOWNSHIP 18W
COMMUNITY WELL FOR SEVERAL MILLTOWN RESIDENTS.

Distance to above well or building:

APPROX. 425 ft. NORTH FROM RESERVOIR.

SCORE = 4 ON MATRIX

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

35 HOMES IN MILLTOWN SERVED BY CONTAMINATED WELLS.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

INFORMATION NOT PRESENTLY AVAILABLE

Total population served by ground water within a 3-mile radius:

35 HOMES X 3.8 INDIVIDUALS/HOME
= 133

SCORE = 2 ON MATRIX

DIST./POP. MATRIX SCORE = 20

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

ARSENIC
LEAD
COPPER
ZINC
MANGANESE

Rationale for attributing the contaminants to the facility:

SEE J. MOORE DRAFT LETTER 10/3/82.
ALSO BARLEY THESIS
SEDIMENTS ARE IN RESERVOIR (RIVER) BOTTOM

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Name/description of nearest downslope surface water:

Average slope of terrain between facility and above-cited surface water body in percent:

Is the facility located either totally or partially in surface water?

Is the facility completely surrounded by areas of higher elevation?

1-Year 24-Hour Rainfall in Inches

Distance to Nearest Downslope Surface Water

Physical State of Waste

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

SEE GROUNDWATER RATIONALE PREVIOUS PAGE 4

Compound with highest score:

ARSENIC

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

SEE GROUNDWATER RATIONALE PREVIOUS PAGE 4.

Basis of estimating and/or computing waste quantity:

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

IRRIGATION
RECREATION

SCORE = 2

HAZARDOUS SUBSTANCE HAS BEEN PERIODICALLY FLUSHED FROM RESERVOIR INTO RIVER.

Is there tidal influence?

No.

Distance to a Sensitive Environment N/A

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

SCORE = 0

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

MONTANA DNRC DATA AVAILABLE
ON SURFACE WATER WITHDRAWALS
ALL WITHDRAWALS FOR IRRIGATION
DIVERSION COORDINATES AVAILABLE @ EPA-MD.

ALSO SCS DATA (PERSONAL COMMUNICATION; BEN HARI

ALL IRRIGATION < 2000 ft. FROM RIVER.

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

DNRC DATA: 592 ACRES (TOTAL) → POP. EQ. = 888

SCS DATA: PRINE & BANDY RANCH ON BANDMANN FLATS: 96.5 ACRES
POP. EQ. = 144

Total population served:

EITHER DATA: POP. 101–1000
MATRIX HRS P. 36

SCORE = 20

Name/description of nearest of above water bodies:

CLARK FORK RIVER (COLUMBIA RIVER SYSTEM)
DOWNSTREAM OF MILLTOWN DAM.

Distance to above-cited intakes, measured in stream miles.

ALL DIVERSIONS < 3 STREAM MILES FROM DAM.
COORDINATES AVAILABLE.

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

Date and location of detection of contaminants

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Most incompatible pair of compounds:

Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?